

Remarks

Claims 1-4, 6-9, 11 and 13-16 were pending.

Claims 1-4, 6-9 and 13-16 are cancelled.

Claim 11 is amended.

Claims 17-21 are new.

This application now contains claims 11 and 17-21.

Claim 11 is amended to:

- insert the phrase "produced upon contact with nitrogen oxides originating from combustion gases during curing in a gas oven" into the first line of the claim,
- to delete the "s" from the first occurrence of the word "comprises",
- to insert the phrase "and the coatings produced there from," directly after the list of resins,
- to replace the word "comprising" that appears directly after "there from" with the phrase " which process comprises"
- to delete the phrases "or applying to", " before curing", "compound of the", "type as" and "which compositions in the course of curing, are in contact with nitrogen oxides originating from combustion gases" from the last few lines of the claim.

Support is inherent in the claim.

Support for claims 17-21 can be found in now cancelled claims 3, 4 and 7-9.

No new matter is added.

Claim Rejections

Before addressing the present claim rejections, Applicants note the long prosecution history of the present case, including the recent Appeal affirming the Examiner's rejection. Applicants, however, still believe that the instant application describes a invention of merit and to aid in prosecution have greatly narrowed the scope of the claims to a process for reducing discoloration caused by combustion gasses, particularly nitric oxides, page 1 and the bottom half of page 39 in the disclosure.

Many of the amendments to claim 13 appear to be mainly cosmetic, for example, moving the reference to "nitrogen oxides originating from combustion gases" from the end of the claim body to the preamble. Applicants are aware that the preamble generally has no impact on the examination of the claim except when the preamble breathes life and meaning into the claim.

Applicants respectfully submit that in the present case the reference in the preamble to reducing the discoloration caused by nitric oxides does breathe life and meaning into the claim and focuses attention on the essence of the invention; Applicants discovery that the benzofuran-2-one stabilizer has a significant impact on retarding a particular type of discoloration of the coating. This discoloration is frequently referred to as "gas fading" and is due to the presence of the combustion products produced during the operation of gas ovens and other devices, see the enclosed US 5,596,033 column 1, lines 9-51. Significantly, traditional phenol antioxidants are not very effective at stopping this discoloration and may actually worsen the situation in some cases.

Applicants are also aware that merely citing a new use for an existing formulation is not patentable. Applicants respectfully submit that this is not the case in the instant application. As described in US 5,596,033, gas fade caused by combustion gasses is a significant and specific type of degradation not caused by heat and traditional polymer oxidation reactions. As a consequence, traditional techniques for preventing polymer oxidation are not effective. US 5,596,033 discloses a composition comprising hydroxylamine / hindered amine blends that are effective in retarding gas fade in polyolefines. Applicants have discovered that benzofuranones are effective for retarding gas fade in powder coatings which can not always be formulated with the same additives as polyolefines.

Applicants kindly ask that the Examiner consider these remarks in evaluating the following arguments for overcoming the present rejections.

Claims 1-4, 6-9, 11 and 13-16 are rejected under 35 USC 112 second paragraph as being indefinite. Claims 1-4, 6-9, 13 and 14-16 are cancelled. The word "type" is absent from all current claims.

Claim 11 is amended to specify that addition of the bezofuranone stabilizer retards discoloration from gas fade in both the uncured powder coating and the coating derived therefrom.

Claim 9 was rejected for including improper Markush language. Although claim 9 is cancelled, the limitations and much of the language of claim 9 are present in new claim 21. Appropriate changes are incorporated into the language of claim 21 to obviate a similar rejection of the new claim.

In light of the amendments above Applicants respectfully suggest that the rejections under 35 USC 112 second paragraph are addressed and overcome and kindly ask the examiner to withdraw them.

Claims 1-4, 6-9, 11 and 13-16 are rejected under 35 USC 103(a) as being obvious over Ertl, US 4,745,192, Malik et al, US 5,679,733 or Valet US 5,753,729 in view of Dubs US 5,175,312 or Nesvabda et al, 5,516,920 further in view of Nozaki et. al US 5,310,848, Daly et al, US 5,708,039 or Kaplan et al, US 5,847,057.

Claims 1-4, 6-9, and 13-16 are cancelled.

Applicants respectfully traverse the rejections as they apply to remaining claim 13 and new dependent claims 17-21.

It is true that powder coatings, bezofuran-2-one stabilizers in polymers and gas ovens are known entities. Applicants respectfully note however, that no examples exist in the cited art where bezofuran-2-ones are incorporated into powder coatings, no guidance is given relating to the use of benzofuran-2-ones as a solution to gas fade and that in each of the primary references, benzofuran-2-ones are mentioned only in the most general terms as part of a laundry list of optional materials.

Applicants also respectfully note that while the use of benzofuran-2-ones are disclosed in polymers, including coatings, there is no specific record of this actual use in coatings prior to the instant application and the use of benzofuranones in coatings is far from a recognized practice. The benefits regarding gas fade are therefore presumed to be unknown.

Ertl discloses hindered amine light stabilizers for plastics and coatings and also mentions that other compounds may "be added to the plastics" including benzofurn-2-one compounds, column 7, line 67 through column 8, lines 1-44. Benzofuran-2-ones are mentioned only once as part of a list of variety of additional stabilizers, are not exemplified, no specific Benzofuran-2-one compounds are named and gas fade is not mentioned.

Malik likewise discloses hindered amine light stabilizers for plastics and coatings and mentions benzofuranones as a suitable anti-oxidant which may be added to the polymer, column 16, lines 40-47. As in Erthl, benzofuran-2-ones are mentioned only once as part of a list of variety of additional stabilizers, column 16, line 40 through column 17, line 46, are not exemplified, no specific Benzofuran-2-one compounds are named and gas fade is not mentioned.

Applicants respectfully note that in spite of the passing reference to powder coatings in Ertl and Malik, the only examples where stabilizers are added to polymers is in Malik, columns 18 and 19, use only polypropylene as a polymer and do not incorporate benzofuranones. Applicants respectfully maintain no guidance is given in these references to use benzofuran-2-ones in a process to reduce gas fade.

Valet discloses ultraviolet absorbers that are particularly effective in coatings. Benzofuranones are mentioned only at the end of an enormous list of optional additives, column 26 through the end of column 30, their use is not exemplified and the problems of gas fade are not mentioned.

Applicants respectfully maintain that the primary references are silent as to gas fade and provide no reason as to why the practioner would chose benzofuranones from the list of alternate additives and incorporate them into coatings as a way to minimize the discoloration due to gas fade.

Regarding the secondary references, Dubs and Nesvabda, specific benzofuranone stabilizers used in the instant process are disclosed. In both references, the compounds are used for

stabilization of organic material in general, more specifically for stabilization against thermal, oxidative and actinic degradation, abstracts and first substantive paragraph of each disclosure. As mentioned above, gas fade is recognized as distinctly different from these degradation modes addressed in Dubs or Nesvabda. Also, Dubs offers no real guidance regarding the use of these stabilizers, preferring "polymers, for example synthetic polymers or thermoplastic polymers" particularly preferring "polyolefins, for example polypropylene or polyethylene", column 5, lines 57-61, while Nesvabda refers to "a polymer or a lubricant", column 1 paragraph 1, and exemplifies the use in only polypropylene and polyethylene, column 55.

Nesvabda does specifically detail the efficacy of benzofuranones as processing stabilizers "especially under the action of heat which occurs during the processing of thermoplasts". Applicants respectfully maintain that not only are the processing conditions for thermoplastic polymers are significantly different than the baking of a coating, but, more importantly, gas fade caused by combustion gasses such as nitric oxides will discolor a resin that is merely in the vicinity of the source of combustion, e.g. a warehouse with a gas heater.

The primary references mention the benzofuranone stabilizers only as part of a list known additives; the secondary references are directed mainly to thermoplastics and lubricants and only briefly mention coatings. Gas fade is not discussed in any of these references.

Applicants agree that benzofuranones are known as part of the arsenal of stabilizers used in polymeric systems. Applicants agree that in searching for a solution to the problems of gas fade in coatings, the practitioner could compile a list known polymer stabilizers and test each in his system until a solution was found. Applicants respectfully aver that such a process could require an inordinate amount of work given the combined teaching in the cited art. Applicants also question whether one would necessarily expect compounds useful in solving the problems of mainly thermally induced, oxidative chain reaction degradation to be effective in preventing the degradation due the action of nitric oxides.

The tertiary references are not discussed here as they would not provide guidance to the selection of benzofuran-2-ones for a solution to the problem.


Applicants respectfully suggest, in light of the discussion above and the data presented during the course of the prosecution of this and the parent applications, that the discovery that benzofuran-2-ones are particularly effective in preventing gas fade of the instant coating compositions is significant and unexpected.

Applicants also respectfully suggest that the rejections under 35 USC 103(a) are addressed and overcome and kindly ask the examiner to withdraw them and find claims 11 and 17-21 allowable in that the process for reducing the discoloration of powder coatings produced upon contact with nitrogen oxides by incorporating benzofuran-2-ones was unknown at the time of the invention and that no examples of such a process exist in the art.

In the event that minor amendments will further prosecution, Applicants request that the examiner contact the undersigned representative.

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